

REMARKS/ARGUMENTS

Applicants have carefully reviewed the Examiner's Office Action dated August 23, 2005, in which the Examiner rejected claims 1 and 2 under 35 U.S.C. 102(b) as being anticipated by Choi et al (USPN. 6,424,225); and objected to claims 3-7 as being dependent upon a rejected base claim.

Amendments to the Claims

Applicants have added claim 8-14 in order to more particularly define the invention taking into consideration the outstanding Official Action.

Rejection of claims 1 and 2 under 35 U.S.C. 102(b) Choi et al (USPN. 6,424,225)

The rejection of claims 1 and 2 under 35 U.S.C. 102(b) as being anticipated by Choi is respectfully traversed on the grounds that the Choi patent fails to disclose a power amplifier having a bias control circuit capable of maintaining a substantially constant operation current regardless of fluctuations in the reference voltage. Instead, the Choi patent merely discloses a temperature stable power amplifier bias circuit in which the bias circuitry uses current deletion and current supplement techniques in response to temperature fluctuations. The current deletion and current supplement techniques of Choi do not prevent fluctuations in the reference voltage from affecting the operation current, as recited in rejected claims 1 and 2, as well as in new claims 8-14.

The power amplifier defined in claim 1, includes an amplifying transistor; a bias circuit including a bias transistor, the bias circuit providing a bias current to bias the amplifying transistor; and a bias current control circuit responsive to (a) variation in temperature and (b) fluctuation in a reference voltage for adjusting the bias current to control an operation current in the amplifying transistor. In accordance with the present invention, the bias current control circuit 13 regulates the voltage V_p at the base of the bias transistor Q2 in response to fluctuation in a reference voltage as well as in response to variation in temperature. Therefore, the collector current I_c which is an operation current of Q1 is controlled to be substantially constant regardless of fluctuations in a reference voltage and variations in a temperature.

Applicants most respectfully submit that the circuit disclosed in the present invention is totally different from that of Choi, and particularly that Choi fails to disclose the bias current control circuit in order to maintain the operation current I_c (I_{RF}) substantially constant regardless of fluctuations in the reference voltage V_{ref} (V_{REF}). Choi only discloses a temperature stable bias circuit for an RF power amplifier, in which the bias circuitry uses current deletion and current supplement techniques in response to the temperature fluctuations. In particular, while the Choi patent discloses a complicated current compensation circuitry (310) for a power amplifier (300), which operates to control the reference current I_{REF} in order to maintain a reference current to the base terminal of power transistor (336) constant over a wide range of temperature variance, Choi does not disclose or suggest control the reference current I_{REF} of the RF power amplifier in case the reference voltage V_{REF} fluctuates, and in fact fails to give any details of bias circuit operation.

Nothing in the circuitry of Choi corresponds to the claimed bias control in which, even though the reference voltage V_{ref} fluctuates, the voltage V_p is kept constant kept to maintain the bias current I_B (an emitter current of the bias transistor Q2) substantially constant by compensating the voltage fluctuation at the base of the bias transistor Q2 by the bias current control circuit 13, thereby controlling the operation current I_c to be substantially constant.

It is an object and effect of the present invention to provide a power amplifier in which the bias signal is very stable and unaffected by variations in temperature or in reference voltage V_{ref} . In other words, in response to the variation in temperature and the fluctuation in the reference voltage, the voltage at the base of the bias transistor Q2 is regulated and consequently the collector current I_c is controlled to be substantially constant. In contrast, the object and effect of Choi is to provide a temperature stable bias circuit for the RF power amplifier. Consequently, Choi is not intended to provide a power amplifier which is stable regardless of the variation of the reference voltage V_{ref} , and in fact cannot provide the same, but rather only provides a constant reference current when the temperature increases or decreases and the reference voltage is stable.

Consequently, the subject matter of claims 1 and 2 (and claims 8-14 which also recite compensation for bias voltage fluctuations) is totally different from the disclosures of the cited reference, and withdrawal of the rejection of claims 1 and 2 under 35 USC 102(b) is most respectfully requested. It is respectfully noted that the subject matter of claims 3-7 has already been indicated as allowable.

CONCLUSION

Applicants believe that this is a full and complete response to the Office Action. For the reasons discussed above, applicants now respectfully submit that all of the pending claims are in complete condition for allowance. Accordingly, it is respectfully requested that the Examiner's rejections be withdrawn; and that claims 1-14 be allowed in their present form. If the Examiner feels that any issues that remain require discussion, he is kindly invited to contact applicant's undersigned attorney to resolve the issues.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all of the claims now present in the application are most respectfully requested.

Respectfully submitted,

BACON & THOMAS, PLLC

A handwritten signature in black ink, appearing to read 'B. Urcia', followed by a long horizontal line extending to the right.

Date: November 23, 2005

By: BENJAMIN E. URCIA

Registration No. 33,805

BACON & THOMAS, PLLC

625 Slaters Lane, 4th Floor

Alexandria, Virginia 22314

Telephone: (703) 683-0500